AMENDMENTS TO THE CLAIMS

1. **(Currently Amended)** A converging element which converges a light beam from a light source onto each of at least two types of optical information recording media of thickness different between them and made of a transparent plate, said converging element having an inner region near a center axis of the light beam and an outer region far from the center axis and adjacent to said inner region, said outer region having a plane optimized to converge the light beam transmitting said outer region onto a first optical information recording medium among the optical information recording media, said inner region having a plane optimized converge the light beam transmitting said inner region onto ~~another~~ a second optical information recording medium having a larger thickness than the first one, wherein a phase of the light beam transmitting an innermost portion in the plane of said outer region is shifted relative to that of the light beam transmitting an outermost portion in the plane of said inner region,

wherein a light beam of a first wavelength coming in said inner and outer regions transmits through said inner and outer regions to be focused on the first optical information recording medium, while a light beam of a second wavelength longer than the first wavelength coming in said inner and outer regions transmits through said inner and outer regions but the light-beam transmitting only through said inner regions is focused on the second optical information recording medium having the larger thickness..

3-4. **(Canc lled)**

5. **(Original)** The converging element according to claim 2, wherein the plane of said inner region is the plane optimized to converge the light beam transmitting said inner region onto the another optical information recording medium having a smaller thickness than a second optical information recording medium among the optical information recording media.

6. **(Currently Amended)** The converging element according to claim 5, wherein a direction of the shift of the phase of the light beam transmitting the innermost portion of the plane of said outer region is a forward direction.

7. **(Currently Amended)** The converging element according to claim 1, wherein a numerical aperture, NA, of the plane of said inner region and a NA of the entire aperture has a following ~~relationship that~~ relationship:

0.7 * NA of entire aperture ≤ NA of inner region ≤ 0.8 * NA of entire ~~aperture,~~ aperture;

~~and~~ wherein the phase shift of the light beam transmitting the innermost portion of the plane of said outer region to that of the light beam transmitting the outermost portion of the plane of said inner region has a value between 50 and 150 degrees.

8. **(Currently Amended)** The converging element according to claim 1, wherein said converging element is optimized to converge the light beam onto an information recording medium having a thickness of the inner region equal to or smaller than tl*0.6, wherein tl denotes a thickness of a plane of a second information recording medium among the optical information recording media.

wherein tl denotes a thickness of a plane of a second information recording medium among the optical information recording media.

9. **(Original)** The converging element according to claim 2, wherein the innermost portion of the plane of said outer region and the outermost portion of the plane of said inner region construct a smooth line.

10-12. **(Cancelled)**.

13.(Original) The converging element according to claim 1, wherein said converging element comprises a lens which converges the light beam from the light source onto an optical information recording medium and an optical plate element arranged in an optical path between the light source and said lens;

wherein said lens has a plane optimized to converge the light beam transmitting said lens onto the first optical information recording medium when said optical plate element is not cooperated;

wherein said lens comprises an inner region near the center axis of the light beam and an outer region far from the center axis, said inner region and said outer region being divided from each other with an optical step, said lens having a flat plane in said outer region, said lens having a plane in said inner region optimized to converge the light beam transmitting said inner region onto the optical information recording medium -having a larger thickness than the first one when said lens is cooperated with said optical plate element.

14.**(Original)** An optical head comprising:

a light source which generates a light beam;

a converging element which converges a light beam from said light source onto each of at least two types of optical information recording media made of a transparent plate of different thicknesses; and

a photodetector which receives a light reflected from the each of the optical information recording media to convert it to an electric signal;

wherein said converging element comprises an inner region near a center axis of the light beam and an outer region far from the center axis, said outer region having a plane optimized to converge the light beam transmitting said outer region onto a first optical information recording medium among the optical information recording media, said inner region having a plane optimized to converge the light beam transmitting said inner region onto another optical information recording medium having a larger thickness than the first one, and a phase of the light beam transmitting an innermost portion in the plane of said outer region is shifted relative to that of the light beam transmitting an outermost portion of the plane of said inner region.

15. **(Original)** The optical head according to claim 14, wherein said light source generates light beams of two different wavelengths.

16. **(Original)** The optical head according to claim 14, wherein said light source generates a light beam of one wavelength.

17-19. **(Cancelled)**

20.**(Currently Amended)** The optical head according to ~~one of claims 14 to 19~~ claim 14, wherein the plane of said inner region has the plane optimized to converge the light beam transmitting said inner region onto the another optical information recording medium having a smaller thickness than a second optical information recording medium among the optical information recording media.

21.**(Original)** The optical head according to claim 20, wherein a direction of the shift of the phase of the light beam transmitting the innermost portion of the plane of said outer region is forward direction.

22.**(Original)** The optical head according to claim 21, wherein numerical aperture, NA, of the plane of said inner region and NA of the entire aperture has a following relationship that

0.7 * NA of entire aperture S NA of inner region $\leq$ 0.8 * NA of entire aperture,

and phase shift of the light beam transmitting the innermost portion of the plane of said outer region to that of the light beam transmitting the outermost portion of the plane of said inner region has a value between 50 and 150 degrees.

23.**(Currently Amended)** The optical head according to ~~one of claims14 to 22,~~ claim 14, wherein said converging element is optimized to converge the light beam onto an information recording medium having a thickness of the inner region equal to or smaller than t1*0.6 wherein t1 denotes thickness of a plane of a second information recording medium among the optical information recording media.

24. **(Currently Amended)** The optical head according to ~~one of claims 14 to 23,~~ claim 14, wherein at least two of said photodetector are provided for said at least two optical recording information media of different thicknesses.

25-27. **(Cancelled)**

28.**(Original)** The optical head according to claim 14, wherein said converging element comprises a lens which converges the light beam from the light source. onto an optical information recording medium and an optical plate element arranged in an optical path between said light source and said lens;

wherein said lens has the plane optimized to converge the light beam transmitting said lens onto the first optical information recording medium when said optical plate element is not cooperated therewith, and said optical plate element comprises an inner portion near a center axis of the light beam and an outer portion far from the center axis, said inner portion and said outer portion being divided from each other with an optical step, said lens having a flat plane in said outer region, said lens having a plane in said inner region optimized to converge the light beam transmitting said inner region onto the another optical information recording medium having a larger thickness than the first one when said lens is cooperated with said optical plate element.

29. **(Cancelled)**

30. **(Original)** An optical information recording and reproducing apparatus comprising:

a light source which generates a light beam;

a converging element which converges a light beam from said light source onto each of at least two types of optical information recording media of different thicknesses and made of a transparent plate;

a photodetector which receives a light reflected from the each of the optical information recording media to convert it to an electric signal; and

a signal processor which distinguishes the type of optical information recording medium and reads information selectively from the electric signal;

wherein said converging element comprises an inner region near a center axis of the light beam and an outer region far from the center axis, said outer region having a plane optimized to converge the light beam transmitting said outer region onto a first optical information recording medium among the optical information recording media, said inner region having a plane optimized to converge the light beam transmitting said inner region onto another optical information recording medium having a larger thickness than the first one, and a phase of the light beam transmitting an innermost portion in the plane of said outer region is shifted relative to that of the light beam transmitting an outermost portion of the plane of said inner region.

31. **(Original)** The apparatus according to claim 30, wherein said converging element comprises an object lens which comprises the inner region and the outer region.

32.**(Currently Amended)** The apparatus according to claim 31, wherein when the light beam is converged onto the first optical information recording medium, and wave-front aberration satisfies the condition that

total amount of aberration $\geq$ 20 mλ (rms),

and

fifth spherical aberration $\leq$ 20 mλ (rms).

33.**(Currently Amended)** The apparatus according to claim 32, wherein when the light beam is converged onto the first optical information recording medium, and wave-front aberration satisfies the condition that

seventh spherical aberration $\leq$ 30 mλ (rms).

34.**(Currently Amended)** The apparatus according to ~~one of claims 31 to 33,~~ claim 31, wherein the plane of said inner region of said converging element has the plane optimized to converge the light beam transmitting said inner region onto the first optical information recording medium having a smaller thickness than a second optical information recording medium among the optical information recording media.

35-36. **(Cancelled)**

37.**(Currently Amended)** The apparatus according to ~~one of claims 31 to 36,~~ claim 31, wherein said converging element is optimized to converge the light beam onto an information recording medium having a thickness of the inner region equal to or smaller than t1*0.6 wherein t1 denotes thickness of a plane of a second information recording medium among the optical information recording media.

38. **(Currently Amended)** The apparatus according to ~~one of claims 31 to 37,~~ claim 31, wherein said photodetector is provided for each of the optical recording information media of different thicknesses.

39.**(Original)** The apparatus according to claim 30, wherein said element comprises a lens which converges the light beam from the light source onto an optical information recording medium and an optical plate element to be cooperated therewith;

wherein said lens comprises a first inner portion near a center axis of the light beam and a first outer portion far from the center axis, said first outer portion having a plane optimized to converge the light beam transmitting said first outer portion onto the first optical information recording medium, said first inner portion having a plane optimized to converge the light beam transmitting said first inner portion onto the another optical information recording medium having a larger thickness than the first one;

wherein said optical plate element comprises a second inner portion and a second outer portion divided from the second inner portion with an optical step, said second inner and outer portions are arranged such that the light beam transmitting said first outer portion transmits said second outer portion while the light beam transmitting said first inner portion transmits said second inner portion when said optical plate element is cooperated with said lens.

40.**(Original)** The apparatus according to claim 39, wherein said optical plate element and said lens are held by a movable member having a driver means which moves it in focus and tracking. directions for said lens, and said optical plate element and said lens are arranged to keep dynamical balance relative to a center of gravity of said movable member.

41.**(Original)** The apparatus according to claim 30, wherein said converging element comprises a lens which converges the light beam from the light source onto an optical information recording medium and an optical plate element arranged in an optical path between the light source and said lens,

wherein said lens has the plane optimized to converge the light beam transmitting said lens onto the first optical information recording medium when said optical plate element is not used;

wherein said optical plate element comprises an inner region near the center axis of the light beam and an outer region far from the center axis, said inner region and said outer region being divided from each other with an optical step, said lens having a flat plane in said outer region, said lens having a plane in said inner region optimized to converge the light beam transmitting said inner region onto the another optical information recording medium having a larger thickness than the first one when said lens is cooperated with said optical plate element.

42.**(Original)** The apparatus according to claim 41, wherein said light source generates light beams of two wavelengths, and said lens has a plane in said inner region optimized to converge the light beam of a second wavelength different from a first one generated by said light source and transmitting said inner region onto the another optical information recording medium having a larger thickness than the first one.

43-57. **(Cancelled)**